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ABSTRACT

This feasibility study assesses the potential of optical technology in the development of accessible bibliographic and location data networks both in Canada and within the international MARC (Machine-Readable Cataloging) network. The study is divided into four parts: (1) a market survey of cataloging and interlibrary loan librarians to determine what the installed base of CD-ROM cataloging systems was in Canada, how the systems were being used, and library preferences for a potential NLC (National Library of Canada) product on CD-ROM; (2) an examination of production and distribution options which showed that every organization that distributes data to the library market in Canada has a CD-ROM product; (3) consideration of the standards that are beginning to emerge in the CD-ROM industry, particularly the standard for a logical file format; and (4) an outline of the phases necessary for a pilot project. (7 charts) (EW)

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REPORT OF

A FEASIBILITY STUDY ON DATA DISTRIBUTION ON OPTICAL MEDIA

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EXECUTIVE SUMMARY

The objectives of the feasibility study were:

a) To assess the potential of optical technology to assist NLC to fulfil its mandate with particular reference to making bibliographic and location data accessible within Canada, and within the international MARC network.

b) To contribute to NLC systems and service planning by assessing the impacts on NLC systems and services of existing, planned and potential distribution of bibliographic and location data on optical media within Canada within the next year.

In order to achieve these objectives, the study was divided into four parts:

Part 1 was a market survey to determine what the installed base of CD-ROM cataloguing systems was in Canada, how the systems were being used, and the library preferences for a potential NLC product on CD-ROM. Two groups were surveyed: those using CD-ROM systems, and those not using CD-ROM systems, but actively using NLC services. About 70 libraries are currently using a CD-ROM cataloguing system, and it was clear from the survey that the technology appeals to libraries of all types: school, public, academic and college. It was also clear that CD-ROM cataloguing services fill a need for onsite machine-readable cataloguing data. The systems were used both for current cataloguing and RECON and almost 80% were downloading records to an in-house computer. However, there was a strongly expressed need for Canadian cataloguing data.

Both cataloguing librarians and ILL librarians were surveyed for their preferences for a CD-ROM product from NLC. The DOBIS union catalogue ranked the highest with both groups. The second and third choices for ILL staff were a combined serials product (*Union List of Serials in the Social Sciences and Humanities in Canadian Libraries* and *Union List of Scientific Serials*) and regional union catalogues respectively. The second and third choices for cataloguing staff were name authorities and Canadiana.

Part 2 of the study looked at production and distribution options. A review of the market indicated that every organization that distributes data to the library market has a CD-ROM product.

Part 3 looked at the standards that are beginning to emerge in the CD-ROM industry. The most important development has been the development of a standard for a logical file format, sometimes called the "High Sierra" standard. This standard, accompanied by special software to allow standard microcomputer operating systems to interface with CD-ROM drives and discs, will allow discs to be interchanged at one workstation without having to reboot and reconfigure systems each time.

Part 4 outlined the phases necessary for a pilot project.

PART 1:
MARKET ASSESSMENT FOR CURRENT AND POTENTIAL NEW DISTRIBUTION SYSTEMS

1.1 INTRODUCTION

The purpose of this part of the feasibility study was to identify how many Canadian libraries are currently using CD-ROM and other optical media products for bibliographic and location data, how they are using them, and to determine the market potential for specific types of NLC data. The objectives of Part 1 were to meet the following work statement items:

a) Identify the services already available, announced, or which may be made available within the next year for the delivery of bibliographic and location data to Canadian libraries on optical media.

b) Identify existing and planned use by Canadian libraries of the services identified in (a).

c) Review the possible impacts of the services identified under (a) above on NLC systems and services.

In order to meet these objectives, Part 1 is divided into three major sections:

Section 1.2 looks at the services that are currently available to Canadian libraries for the distribution of bibliographic or location data on optical media and at their use in Canadian libraries. While a total of five such services were identified, by far the most popular was the *BiblioFile* product, produced by The Library Corporation, and almost all Canadian library experience with CD-ROM is with this product.

Section 1.3 provides a market assessment of both CD-ROM users and non-users. The assessment was undertaken by a survey of 44 libraries and related institutions. Twenty-four of those libraries were CD-ROM users and twenty were not. These two groups were surveyed by telephone and both the Heads of Cataloguing and Interlibrary Loan were interviewed to determine how they were currently using their CD-ROM product (if applicable), which NLC products and services they were currently using, the degree of automation in their libraries, and their preferences for potential CD-ROM products with NLC data.

Section 1.4 looks at the implications of the market assessment. It considers the appeal of CD-ROM to a wide variety of libraries, the need that it fills for onsite machine-readable cataloguing data, the potential impact of commercial CD-ROM products on existing NLC systems and services, and the market potential of NLC products on CD-ROM. It also provides a preliminary discussion of the potential of new markets for NLC data.

1.2 OPTICAL MEDIA SERVICES AVAILABLE TO CANADIAN LIBRARIES

There are five services available commercially which offer bibliographic data to libraries. These are:

A. *BiblioFile* (The Library Corporation)
B. *LaserQuest* (General Research Corporation)
C. *LASERFILE* (Library Systems and Services, Inc.)

D. *LaserCat* (Washington Library Network)
E. Utlas M/100 with *DisCon*

All of the services are produced on CD-ROM, with the exception of LASERFILE, which is produced on a 12" videodisc. One other Canadian service is about to be published, which is the database of the Centrale de Bibliotheque, produced by Bibliofiche and aimed particularly at small public and school libraries in Quebec.

All of these services, with the exception of the Bibliofiche product, provide LC MARC records. Canadian content is limited to Canadian imprints catalogued by the Library of Congress.

In addition, there are two projects whereby a library and a consortium have undertaken projects to put their library catalogues on CD-ROM. The University of Guelph has recently published its catalogue on CD-ROM and has offered it to other university libraries free of charge. Those other libraries can use the Guelph CD-ROM to locate materials. The Ontario Library Consortium (OLC), a group of 20 county and municipal public libraries in Ontario, has undertaken an extensive RECON project with the intention of creating a CD-ROM union catalogue early in 1988. This catalogue will be used for resource sharing and as the online public access catalogue in most of the participating libraries. The RECON project is using *BiblioFile*; the online catalogue will be produced by Brodart.

There are other products that carry bibliographic data but which are intended primarily as book ordering systems. These include Bowker's *Books in Print Plus* and *Ulrich's Plus* as well as Ingram's *LaserSearch* product. Each of these products offers a telecommunications link to a vendor for electronic ordering. As National Library data is used primarily for cataloguing and interlibrary loan, the book ordering systems are not considered in detail in this report.

Following is a description of the five commercial products and some discussion of their use in Canada. This information was compiled from product literature, vendor discussions and specific product descriptions prepared for ITS by Walter Giesbrecht. These should be referred to for a more complete product description.

A. *BiblioFile* (The Library Corporation)

The *BiblioFile* cataloguing system contains over 4 million LC MARC English-language records on four compact discs (NOTE: The database was recently remastered and compressed; the January 1988 remastered version consisted of 3 discs). The database includes monographs, serials, Government Printing Office (GPO) publications, music, films, maps, and Canadian publications. Two other database options are also available - the LC Foreign database (almost 1 million records) and the ANYBOOK database which contains 1.5 million records of recently published books along with publisher information. As with most CD-ROM systems, *BiblioFile* requires an IBM-XT or compatible plus a CD-ROM drive for hardware. The system is menu driven and allows users to:

- search the database (by author, title, LCCN, ISBN, ISSN, or GPO number)
- edit MARC records
- create original MARC records
- print cards and labels
- display the catalogue card image

- save edited records
- transmit directly to another computer (i.e. upload)
- convert to magnetic tape for third-party data manipulation, e.g. for fiche catalogues

BiblioFile has over 900 installations in the US and about 70 Canadian installations (NOTE: As of March 1988, these figures have changed to about 1500 total subscribers and about 100 in Canada). It is by far the most popular CD-ROM product in Canada. The customer base in Canada is estimated to be about 17% academic libraries, 36% public libraries, 10% college libraries, and 37% school boards or school libraries. A major reason for its popularity is the low cost. Many libraries have purchased a "start-up" package of about CAN$4000 for the CD-ROM drive, software, annual quarterly subscription and software updates and support. Others pay approximately CAN$1200 for a quarterly subscription, and about CAN$2100 for a monthly subscription.

BiblioFile can support from 1-8 CD-ROM drives at one time. While this means users can use the system with only one drive, it does mean that these users (in fact, any users with fewer than 3 drives as of January 1988) will have to swap discs to get at data not included on the index disc.

B. *LaserQuest* (General Research Corporation)

LaserQuest provides access to a database of over four million MARC records on four CD-ROM discs, with updates on a fifth disc. These records include over 2 million MARC records from the Library of Congress and about 2 million records contributed by GRC's customers which include all types of libraries in the US The records include both English and foreign language material, but Canadian content is limited to records catalogued by LC (NOTE: GRC intends to provide the full Canadiana monographs and music and sound recordings files in CANMARC format to Canadian subscribers of *LaserQuest* beginning May 1988). *LaserQuest* allows a library to:

- search the database (by title only; ISSN for serials)
- edit Marc records
- create original MARC records
- save edited records on floppy disk
- print cards (labels and bibliography format are planned).
- transmit directly to another computer system (e.g. the GRC database of an in-house circulation system)
- convert to magnetic tape for third party data manipulation (e.g. fiche catalogues).

LaserQuest has about 40 customers in the US but no Canadian installations although three institutions (Memorial, Laurentian and one other) are currently testing the product. The initial *LaserQuest* cost is CAN$6500, which includes the first year licence to use the database and software; profile setup; User's Manual; toll-free customer support; one CD-ROM drive, interface board and cable. The annual cost of a subscription to the supplemental discs (cumulative bi-monthly updates) is approximately CAN$2900. There is an additional US$500 per year fee for software licensing and maintenance.

C. ***LASERFILE*** **(Library Systems and Services, Inc.)**

LASERFILE provides its cataloguing service on 12" digital video disc. It provides 2.6 million records on 2 discs. It offers much the same functionality as the other services allowing customers to:

- search the database (by title/author, author/title, LCCN, ISBN, and ISSN)
- edit a record
- create original records
- print catalogue cards and labels
- transmit directly to another computer system

LASERFILE has two Canadian installations at the Kitchener Public Library and Oshawa Public. Pricing varies according to the size of system purchased and the specific configuration. Their smallest system, called the "400 Series", costs about $11,000 for two video disc players and related equipment. The IBM XT equivalent computer is extra, as is the software licence at about $1000.

D. ***DisCon*** **(Utlas, Inc.)**

The Utlas M/100 system with *DisCon* provides access to 6,000,000 Library of Congress records for use in retrospective conversion. The system runs on IBM-PC computers and includes 4 CD-ROM discs mounted simultaneously in 4 CD-ROM players. The database contains 4.2 million REMARC records and 1.8 million MARC records (1968 to mid-1984). The 6 million records are all monographs. They are indexed by LCCN, ISBN (MARC only), and title (including alternate titles and series titles).

Unlike the stand-alone systems described above, the M/100 system with *DisCon* does not provide a record locally. The bibliographic data included on the CD-ROM disc is limited to fields 010 through 300 and provide enough data to verify the presence of the full record in the Utlas database. "Hits" are sorted on floppy discs after local information, such as call number and holdings, is added. The floppies are sent to Utlas where the full records are extracted from the Utlas database and returned to the user on magnetic tape.

If the desired record cannot be found on the CD-ROMs, the user may enter a brief record to be searched against the complete Utlas database of over 40 million records, or create a MARC formatted record to be included with the returned "hits".

The M/100 is rented to the user so there is no capital investment in optical disc hardware. The rental price is $1200 per month, which includes the software, documentation, CD-ROM discs, and CD-ROM players. The user is expected to supply the microcomputer. There is an additional charge of $0.30 per record for each record retrieved from the Utlas database.

Utlas has seven *DisCon* customers, all of which are in the US They are expecting their first Canadian installation in the fall of 1987.

E. *LaserCat* (Washington Library Network)

LaserCat contains all of the records with holdings attached in the WLN database plus the last two years of LC MARC and Books Canada. The total number of records is 2 million and the product resides on 3 discs. The discs are updated quarterly. The system is designed for both cataloguing and interlibrary loan functions, and WLN developed two separate user interfaces for these two functions. One displays full MARC coding, while the other provides displays appropriate for online catalogue use, with the option of seeing holdings. *LaserCat* allows users to:

- search the database (by author, title, subject, LCCN, ISBN, and ISSN)
- edit MARC records
- print cards and labels (licensed by WLN from Ultracard/MARC)
- create original cataloguing
- transmit records to an in-house computer
- send diskettes with their holdings to the central WLN database; cost is US$0.40 per record

There are currently 246 *LaserCat* installations in the US, with one in Canada at Trinity Western College in Langley, BC. About a third of the installations are non-WLN members. *LaserCat* sells for US$1300 or about CAN$1800.

1.3 THE MARKET ASSESSMENT

The market assessment was undertaken by a telephone survey. Two groups of libraries were identified. The first group was already using a CD-ROM product to access bibliographic information, while the second group was not using CD-ROM technology for this purpose, but had been identified as key users of NLC products and services by NLC staff. At each institution, both the Head of Cataloguing and the Head of Interlibrary Loan were interviewed. The survey had several objects:

1. To identify how libraries were using their CD-ROM product, i.e. which library functions they were using it for, and the automation environment in which they were working.

2. To identify which National Library products were being used.

3. To determine whether there is an installed base of microcomputers in libraries, which would indicate a skill level and hardware base conducive to CD-ROM products.

4. To determine customer preferences for National Library data on CD-ROM.

1.3.1 The Sample

A total of 44 libraries and related institutions were surveyed. Twenty-four were CD-ROM users (one was testing a product) and twenty were representative of users of NLC products or services. The two groups were not mutually exclusive; for example, while a CD-ROM product was in use in the cataloguing department, this had no effect on the way ILL was performed. While in most cases both the Head of Cataloguing and the Head of Interlibrary Loan were interviewed, some institutions did not perform cataloguing functions (e.g. regional library services which provide ILL functions for public libraries) and some institutions did not provide interlibrary loan (e.g. school boards). The names of

the specific institutions surveyed are included with the analysis of the results of each group.

1.3.2 CD-ROM users (total of 24)

The CD-ROM users were identified primarily from a list maintained by Laura Neame, the editor of the Canadian CD-ROM newsletter. Other users were identified by fellow librarians during the course of the survey. Canadian institutions that use CD-ROM for bibliographic functions are estimated at 70 to 75 total. Of these, almost all are using one product, *BiblioFile*. Consequently, all of the users in the sample were *BiblioFile* users. The other product currently in use in Canadian libraries is *LASERFILE*, primarily in the 12" videodisc format. It is used in two Ontario public libraries. *LaserQuest* has three potential customers, while *LaserCat* (WLN) has one Canadian installation.

The total sample for this survey is 24. That sample includes all of the school boards and colleges identified to the consultant to date. Most academic users are also included, with only the University of Calgary excluded. Public libraries number 19 more than were included in the survey, however, those 19 are all participants in the Ontario Library Consortium (OLC). The OLC central office was surveyed, as was one participant, Middlesex County library. The remaining unsurveyed CD-ROM users are thought to be individual school libraries, primarily in the Prairie provinces and Quebec where *BiblioFile* has been sold in conjunction with such microcomputer systems as Ocelot and Circulation Plus.

The specific libraries included in the survey were:

PUBLIC LIBRARIES (5)

Grimsby	Ontario
Middlesex County	Ontario
Ontario Library Consortium (20)	Ontario
Richmond Public	BC
St. Albert	Alberta

ACADEMIC LIBRARIES (10)

Brandon University	Manitoba
Carleton University	Ontario
Laurentian University	Ontario
Memorial University	Newfoundland
Mount St. Vincent	Nova Scotia
Queen's University	Ontario
Universite de Sherbrooke	Quebec
University of Guelph	Ontario
University of New Brunswick	New Brunswick
University of Western Ontario	Ontario

COLLEGE LIBRARIES (5)

Cariboo College	BC
Grande Prairie Regional College	Alberta
Lethbridge Community College	Alberta
Okanagan College	BC
Red Deer Community College	Alberta

SCHOOL BOARDS (4)

Dartmouth Board of Education	Nova Scotia
East York Board of Education	Ontario
Vernon School District	BC
Waterloo County Separate School Bd	Ontario

1.3.3 The survey results

1. For how long have you had your CD-ROM product?

- Average number of months = 9.7
- Ranged from 1 month to 18 months
- 6 had used it for 6 months or less
- 5 had used it for 18 months

2. What function do you use it for?

- 3 use it exclusively for RECON
- 14 use it exclusively for current cataloguing
- 7 use it for both RECON and current cataloguing

3. Do you download records to another computer system?

- 19 yes (79%)
- 5 no (21%)

4. Do you create catalogue cards or labels from your CD-ROM system?

- 7 yes (29%)
- 17 no (71%)

5. What alternatives did you consider?

Utlas	12	Dobis	1
LSC	3	LC Tapes	1
MRDS	3	BNA	1
LASERFILE	2	Jobbers	1
BADADUQ	1	Sydney	1
Marcive	1	None	2

6. What NLC products are you currently using?

Canadiana	18	CONSER	7
Authorities	14	Dobis search	5
ULSSSHCL	11	None	6*
ULSS	10		

* This is 25% of all respondents and includes 3 school boards, 1 county library, 1 consortium, and 1 college.

7. Have you cancelled any NLC subscriptions because of using the CD-ROM product?

   2 school boards had cancelled Canadiana fiche.
   All others have not cancelled and are not planning to cancel any subscriptions.

8. Is it necessary to have subject access for ILL?

   - 0 yes (0%)
   - 15 no (100%)
   - 9 not applicable (do not do ILL)

9. ILL Depts.: Do you have a CD-ROM in your Dept.?

   - 4 yes (27% of 15 libraries that do ILL)
   - 11 no (73% of 15 libraries that do ILL)
   - 9 not applicable (do not do ILL)

10. ILL Depts.: Are you planning to purchase a CD-ROM product in the next year?

    - 5 yes (33%)
    - 10 no (66%)
    - 9 not applicable (do not do ILL)

11. ILL Depts.: Do you have a microcomputer in your Dept.?

    - 11 yes (73% of 15 libraries that do ILL)
    - 4 no (27% of 15 libraries that do ILL)
    - 9 not applicable (do not do ILL)

12. Do you report holdings to NLC or Utlas?

    - 10 yes (42%)
    - 14 no (58%)

13. Cataloguing Depts.: What is an acceptable frequency of update for cataloguing data?

    - 2 weekly
    - 13 monthly
    - 8 quarterly
    - 1 semi-annually

14. Cataloguing Depts.: Do you have a microcomputer in your Dept.?

    - 24 yes (100%)
    - 0 no

15. How many microcomputers do you have?

    Average per cataloguing dept. is 2.66

16. Do you have an in-house system, e.g. for circulation control, online catalogue, etc.?

    - 14 yes (58%)
    - 10 no (42%)

17. For product preferences, see Section 1.4.

1.3.4 NLC Users (Total of 20)

The NLC users were chosen from information provided by NLC staff. NLC customers are potentially every library in the country, and indeed some services, such as Canadiana, which has a subscription base of about 700 likely reach most libraries of any size. Because the customer base varies for the various products, a geographical distribution was guided by the geographical distribution of the Interlibrary loan and location service, which indicates that 31% of all requests come from the national capital region, 26% from other Ontario libraries, and 15% from Quebec. The rest of Canada accounts for the remaining 28%.

The specific libraries included in the survey were:

PUBLIC LIBRARIES (8)

Alberta Culture	Alberta
Calgary	Alberta
Nova Scotia Provincial	Nova Scotia
Oakville	Ontario
Ontario Library Service - Escarpment	Ontario
Ottawa	Ontario
Saskatchewan Provincial	Saskatchewan
Victoria	BC

ACADEMIC LIBRARIES (7)

McMaster	Ontario
Universite Laval	Quebec
University of Alberta	Alberta
University of BC	BC
Universite de Montreal	Quebec
University of Saskatchewan	Saskatchewan
University of Toronto	Ontario

SPECIAL/GOVERNMENT LIBRARIES (5)

Canada Health and Welfare	Ontario
Canada Post	Ontario
Hydro Quebec	Quebec
Ontario Legislative Library	Ontario
Treasury Board	Ontario

1.3.5 The survey results

1. Is it necessary to have subject access for ILL?

   - 0 yes (0%)
   - 15 no (100%)
   - 5 not applicable (do not do ILL)

2. ILL Depts.: Do you have a CD-ROM in your Dept.?

   - 0 yes (0%)
   - 15 no (100%)

3. ILL Depts.: Are you planning to purchase a CD-ROM within the next year?

   - 3 yes (25%)
   - 12 no (75%)

4. ILL Depts.: Do you have a microcomputer in your Dept.?

   - 13 yes (87%)
   - 2 no (13%)

   Average number per ILL Dept. is 1

5. What is an acceptable frequency of update for ILL data?

   - 2 weekly (13%)
   - 2 monthly (13%)
   - 9 quarterly (60%)
   - 1 semi-annually (7%)
   - 1 annually (7%)

6. What services are you currently using for cataloguing copy?

Utlas	14	NUC	1
Canadiana	4	CIP	1
DOBIS	4	OCLC	1
MRDS	4	RLIN	1
LC fiche	2	CONSER	1

7. Do you report holdings to NLC or Utlas?

   - 14 yes (78%)
   - 4 no (22%)

8. If you were using a CD-ROM product for cataloguing, would you need to download records to another computer system?

   - 11 yes (61%)
   - 7 no (39 %)

9. Would you need to create catalogue cards?

- 6 yes (33%)
- 12 no (64%)

10. Cataloguing Depts.: What is an acceptable frequency of update for cataloguing data?

- 9 weekly (50%)
- 1 semi-monthly (5%)
- 8 monthly (44%)

11. Are you planning purchase of a CD-ROM?

- 4 yes (22%)
- 14 no (78%)

12. Cataloguing Depts.: Do you have any microcomputers in your Dept.?

- 14 yes (78%)
- 4 no (22%)

Average number of microcomputers in all libraries surveyed = 1.4.

13. What NLC products and services are you currently using?

Authorities	14	DOBIS cataloguing	4
Canadiana	13	CONSER	7
ULSSSHCL	13	CANUC:H	4
ULSS	12	MRDS	2
DOBIS search	11	None	0

Average number of NLC products used by each library = 4.67

14. Do you have an in-house system for circulation, online public access, etc.?

- 11 yes (65%)
- 7 no (35%)

1.3.6 The composite picture

Some of the questions in the surveys were asked of both groups, and it is useful to look at the composite responses. One of the most interesting pictures to emerge from the study is the degree of automation in the libraries surveyed. For example, a full 60% of all libraries surveyed have an in-house system for collection management functions such as circulation control, online catalogue, and so on. 73% of all libraries surveyed are now downloading cataloguing data to another computer system. Most often this was their in-house computer, but for some libraries it was a vendor that would produce a catalogue product for them at some point in the future (e.g. the Ontario Library Consortium). Only 27% responded affirmatively to the need to create catalogue cards or labels from a CD-ROM product. Many libraries were not using cards at all, while some produced only a shelf list card and labels from their in-house system.

The number of microcomputer installations was also significant. 86% of the individual departments surveyed had a microcomputer. This is important for the introduction of CD-ROM systems, because it indicates that the necessary basic hardware investment and microcomputer skills are present in most libraries. It is also interesting to note that on average, the CD-ROM libraries had more microcomputers in both the cataloguing and interlibrary loan departments than did the NLC users.

The specifics for these issues are as follows:

1. Do you have an in-house computer system?

	Y	N	Total
NLC Users	11	7	18
CD-ROM Users	14	10	24
Total	25	17	42
	60%	40%	

2. If you were using a CD-ROM product for cataloguing, would you/do you need to download records to an in-house computer system?

	Y	N	Total
NLC Users	10	6	16
CD-ROM Users	19	5	24
Total	29	11	40
	73%	27%	

3. Do you/would you need to create catalogue cards from a CD-ROM product?

	Y	N	Total
NLC Users	4	12	16
CD-ROM Users	7	17	24
Total	11	29	40
	27%	73%	

4. Do you have a microcomputer in your Department?

	Y	N	Total
NLC Users	26	6	32
CD-ROM Users	35	4	39
Total	61	10	71
	86%	14%	

5. How many microcomputers do you have?

	ILL Avg	Cat Avg
NLC User	1	1.56
CD-ROM User	1.46	2.78

One other part of the composite picture relates to the respondents' participation in the national union catalogue and the use of NLC products and services. Looking at the total picture, just under 60% of all respondents report holdings to either NLC or Utlas. However, the degree of participation of CD-ROM users was much lower. The reasons for not reporting ranged from "we're a small library and I don't think that the National Library would be interested in our collection, it's not unique", to comments from academic libraries that they wanted to report on magnetic tape, but that NLC was unwilling to accept holdings in that format.

6. Do you report holdings to the National Library or Utlas?

	Y	N	Total
NLC User	14 (78%)	4 (22%)	18
CD-ROM User	10 (42%)	14 (58%)	24
Total	24 (57%)	18 (43%)	42

As far as use of NLC products and services were concerned, most libraries use at least three different ones. Chart 1 (p. 19) shows the products and services and the number of surveyed libraries using each. It is also interesting to note that 6 of the libraries/institutions surveyed use none. These were the school boards, a county library that purchases cataloguing information and has a regional service for interlibrary loan, and the Ontario Library Consortium office.

1.4 IMPLICATIONS OF THE MARKET ASSESSMENT

1.4.1 CD-ROM appeals to all types of libraries

Initially it was thought that CD-ROM technology for cataloguing use would appeal primarily to small libraries. This turned out not to be true. All types of libraries are using the technology, primarily the *BiblioFile* product. As mentioned above, the breakdown of *BiblioFile* users is as follows:

37% school boards or school libraries
36% public libraries
17% academic libraries
10% college libraries

CD-ROM technology has been in the market place for only two years, yet over 70 libraries in Canada are now using it. Small libraries are using it as their only source of cataloguing, while larger libraries are using it as their first source, going to more expensive online services such as Utlas for items that they cannot find in the LC MARC

files. Many libraries are accepting quarterly updates on *BiblioFile*, although the survey showed that monthly updates are favoured by most cataloguing departments.

At this point in time the very large academic libraries, such as the University of Toronto, the University of BC and University of Alberta are not using CD-ROM for cataloguing applications nor are they planning to do so. One comment from a large academic institution was that the biggest problem with CD-ROM was that a large library needs multiple workstations that can be distributed around a large campus and multiple CD-ROM workstations and subscriptions are just too expensive.

However, most of the academic institutions surveyed either had purchased or were testing a CD-ROM product in their reference departments, most often in the Health Sciences libraries. Use of these reference products was not surveyed as this study concentrates on CD-ROM products for the distribution of bibliographic and location data.

1.4.2 CD-ROM cataloguing services fill a need for onsite machine-readable cataloguing data

As mentioned above, Canadian libraries are now quite highly automated. With 60% of the libraries surveyed maintaining in-house computers, there is an extensive need for machine-readable cataloguing and until the appearance of CD-ROM systems, there was little choice as to where to purchase it. In addition, CD-ROM cataloguing systems are making automation affordable to a group of libraries that previously could not consider automated systems. One of the most frequently mentioned benefits of the *BiblioFile* system was that it was a fixed cost. Once the annual subscription had been paid for, there were no additional costs. Larger libraries saw it as a way to reduce cataloguing costs.

Another frequently mentioned benefit was that the library had local control, that is, the machine-readable record could be manipulated and the resulting product seen immediately. There was no waiting for cards to be delivered, no extra charges to edit or re-edit a record, no downtime on a remote computer to cope with, and so on. In addition, it was very easy and inexpensive to train staff.

With the high degree of automation in Canadian libraries, CD-ROM technology is easy to absorb. It is simply another option as a source of cataloguing information. With previous technologies like online cataloguing, in-house minicomputers, and even microcomputers, library staff were faced with an extensive learning curve. With online cataloguing, for example, librarians had to learn about MARC coding, as well as how to use computer terminals and a computer interface. Most potential users of CD-ROM technology have already absorbed the basics of either machine cataloguing or at the very least are comfortable with microcomputer basics. CD-ROM is simply a new storage medium which comes with some software to assist with the cataloguing process. The new systems are therefore very easy to integrate into existing systems.

1.4.3 Impact of commercial CD-ROM products on NLC systems and services

In the survey, only two institutions had cancelled an NLC service as a result of using *BiblioFile*. Both were school boards which had cancelled Canadiana. However, some libraries had chosen *BiblioFile* over other sources of cataloguing data, including the MRDS service. It is difficult to determine from the survey data how much the MRDS service will decline as a result of the commercial CD-ROM products, but it is unlikely that other NLC products and services will decline. All of the CD-ROM services currently available offer only LC MARC and therefore the only Canadian imprints are those catalogued by the Library of Congress. The most frequently mentioned weakness of *BiblioFile* was the lack

of Canadian content. Most libraries will have to continue to use NLC products for their Canadian materials.

As for MRDS, the only option that is likely to notice a decline is the selected records option. This service is used both for RECON and for current cataloguing, and the CD-ROM products offer a viable alternative, with the added advantage that the records reside locally and there is therefore no waiting for record delivery. However, the other MRDS options will likely continue with the current customers. The libraries and institutions that purchase the tape services usually have extensive systems that depend on the currency and completeness of the services and none of the organizations surveyed were considering cancellation of these services due to CD-ROM technology.

1.4.4 Market potential of NLC products on CD-ROM

One part of the survey asked respondents to indicate their preference for specific NLC products on CD-ROM. Cataloguing departments were given a different choice to Interlibrary loan departments, although some products would appeal to both areas and were offered in both lists. The results of the survey are indicated in Charts 2 through 7 (pp. 18-21).

This survey dealt only with the desirability of data content. Actual willingness to purchase a product could not be determined as the actual characteristics and price had not been determined.

Charts 2 and 3 (pp. 18-19) show the product preferences for Interlibrary Loan departments for NLC users and CD-ROM users. The top four products were the same for each group, although in a slightly different order. Chart 4 (p. 19) shows the combined results. This chart shows that:

* The DOBIS union catalogue on CD-ROM and a combined serials product (i.e. a combined ULSSSHCL, ULSS, and possibly CONSER) would be equally desirable and are the favoured products for ILL staff.

* Regional union catalogues ranked third.

* The manual union catalogue ranked fourth.

* There is some interest in the National Library catalogue as a product for ILL.

* There is little interest in CONSER or subject area union catalogues (e.g. health sciences collections, agricultural collections) for the ILL staff surveyed (subject area union catalogues may be of strong interest to special libraries which were not strongly represented in the sample).

Charts 5, 6, and 7 (pp. 20-21) show the preferences for a cataloguing product. Chart 2 (p. 20) shows the preferences of the Cataloguing departments of NLC users. These preferences are somewhat different to the preferences of the CD-ROM users. For NLC users, a name authorities was strongly favoured, with some interest in DOBIS, combined serials, and CONSER. The low interest in a Canadiana product may have been due to the fact that many of the libraries surveyed already had good access to Canadiana MARC records, often through Utlas or DOBIS. For the CD-ROM users, DOBIS was the most favoured

product, followed quite closely by Canadian and name authorities. Chart 7 (p. 21) shows the combined responses:

- The DOBIS union catalogue is the most popular product.
- Name authorities follows as a close second.
- Canadiana is third.
- A combined serials product ranked fourth in the number that would find it "very useful", however this is offset by more that would find it "not useful".
- The two foreign MARC services and the two serials lists published separately held little interest for cataloguers.

CHART 1

USAGE OF NLC PRODUCTS AND SERVICES

PRODUCT	NLC USERS	CD-ROM USERS	TOTAL
Canadiana	13	18	31
Name Authorities	14	14	28
ULSSSHCL	13	11	24
ULSS	12	10	22
DOBIS Search	11	5	16
CONSER	7	7	14
DOBIS Cataloguing	4	0	4
CANUC:H	4	0	4
MRDS	2	0	2
None	0	6	6

CHART 2

ILL PRODUCT PREFERENCE - NLC USERS (non-CD-ROM)

PRODUCT	Very Useful	Somewhat Useful	Not Useful
Combined serials	12	1	1
DOBIS Union Cat.	10	0	4
Manual Union Cat.	7	7	0
Regional Union Cat.	7	4	3
ULSSSHCL	5	6	3
ULSS	5	5	4
National Library Cat.	5	3	6
CONSER	2	4	8
Subject Area Union Cat.	1	7	6

CHART 3

ILL PRODUCT PREFERENCE - CD-ROM USERS

PRODUCT	Very Useful	Somewhat Useful	Not Useful
DOBIS Union Cat.	12	3	0
Combined serials	10	2	3
Regional Union Cat.	9	5	1
National Library Cat.	7	8	0
Manual Union Cat.	7	4	4
ULSSSHCL	6	6	3
ULSS	5	7	3
CONSER	1	5	9
Subject Area Union Cat.	1	5	9

CHART 4

ILL PRODUCT PREFERENCE -- NLC USERS AND CD-ROM USERS COMBINED

PRODUCT	Very Useful	Somewhat Useful	Not Useful
DOBIS Union Cat.	22	3	4
Combined serials	22	3	4
Regional Union Cat.	16	9	4
Manual Union Cat.	14	11	4
National Library Cat.	12	11	6
ULSSSHCL	11	12	6
ULSS	10	12	7
CONSER	3	9	17
Subject Area Union Cat.	2	12	15

CHART 5

CATALOGUING PRODUCT PREFERENCE - NLC USERS

PRODUCT	Very Useful	Somewhat Useful	Not Useful
Name Authorities	10	3	3
DOBIS Union Cat.	6	3	7
Combined Serials	5	3	8
CONSER	4	6	6
Canadiana	2	8	6
Inter/Uni MARC	1	8	7
UK MARC	1	8	8
ULSSSHCL	1	6	9
ULSS	1	6	9

CHART 6

CATALOGUING PRODUCT PREFERENCE - CD-ROM USERS

PRODUCT	Very Useful	Somewhat Useful	Not Useful
DOBIS Union Cat.	19	3	2
Canadiana	15	7	2
Name Authorities	13	4	7
Combined Serials	9	5	9
CONSER	6	5	12
Inter/Uni MARC	2	10	12
UK MARC	1	18	5
ULSSSHCL	1	9	13
ULSS	1	8	14

CHART 7

CATALOGUING PRODUCT PREFERENCE - NLC USERS AND CD-ROM USERS

PRODUCT	Very Useful	Somewhat Useful	Not Useful
DOBIS Union Cat.	25	6	9
Name Authorities	23	7	10
Canadiana	17	15	8
Combined Serials	14	8	17
CONSER	10	11	18
Inter/Uni MARC	3	18	19
UK MARC	2	26	19
ULSSSHCL	2	15	22
ULSS	2	14	23

PART 2:
PRODUCTION AND DISTRIBUTION OPTIONS

2.1 INTRODUCTION

The purpose of Part 2 of the feasibility study is to identify the production and distribution process for optical disc, and to identify the technical, legal and cost issues. The objectives of Part 2 were to provide data to meet the following work statement items:

a) Identify the principal product and production/distribution options open to NLC for the use of optical technology to deliver bibliographic and location data to Canadian libraries and the international MARC network.

b) Review the advantages, disadvantages and ballpark costs of each option identified. This review will include consideration of technical, economic, legal, and market factors. The review will also take into account needs for search, retrieval, and transfer to local systems (downloading) in an OSI environment.

In order to meet these objectives, the remainder of Part 2 is divided into two major sections:

Section 2.2 looks at the CD-ROM production process and some of the basic decisions that must be made prior to publishing a CD-ROM product.

Section 2.3 provides an overview of the major players in the library services CD-ROM market. This section considers the CD publishing of the traditional library data suppliers as well as the services of the major CD-ROM service bureaus. Of note is the degree of commitment of the library data suppliers to this new technology, and the various approaches they have taken to get their products to market, from full in-house development to full dependence on a service bureau.

2.2 THE CD-ROM PRODUCTION PROCESS

In order to understand the impact of a new CD-ROM product offering by NLC on its current systems and services, it is necessary to understand the process of CD-ROM production and distribution. This process will have some impact on both staffing and financial resources. The process involves three major activities: design of the product, the actual disc production process, and marketing and user support. For each activity, NLC may decide to contract with a vendor; nevertheless, basic decisions must be made. These activities and their related decisions are described in detail below.

2.2.1 Design and specify product

The first step in creating a CD-ROM product is to design and specify the product. This includes issues related to the database design and user interface, as well as determining the hardware and delivery system components. The steps in this process are as follows:

A. Database and user interface design

a) The first issue that must be decided is who the end user is and how they will use the data to be distributed on CD-ROM. This will affect all other decisions on the product. For example, if the product is aimed at cataloguers, a MARC record display and a record editing capability are required. If it is aimed only at ILL

librarians, a non-MARC display and read only functionality is adequate. Other decisions relate to data content, the number of indices provided, and so on.

b) Identify the data content. This process determines which data will be used for the product, keeping in mind that CD-ROM offers the opportunity to combine data in new ways. For example, it is possible to combine Canadiana and Name Authorities on one disc, or to combine the two union lists of serials now published separately by NLC and CISTI.

c) Determine the access points and related indices. This is a critical issue, because disc storage space is required for each additional access point. Some commercial library vendors have limited their access points in order to reduce the amount of overhead (additional disc storage) required for additional indices.

d) Structure the database for optimal performance. This would include decisions relating to file size, the necessity for data compression techniques, the disc updating method, and so on. This issue becomes of critical importance when the product requires more than one disc, as double or triple the cost of mastering will be required if the full database must be remastered each time it is reissued. Several approaches are possible, such as keeping all indices and current data on one disc so that only the one disc must be remastered when the product is updated.

e) Determine which delivery system software (user interface and retrieval software) to use. This software provides the interface between the end user and the database stored on the CD-ROM. With the exception of the retrieval engine, it is what the user sees and uses to get the desired results. It consists of some or all of the following components:

> The retrieval engine. This serves as a low level interface between the CD-ROM database and the delivery system application programs. It activates the search routines and retrieves the results.
>
> The user interface. This is the part of the software that the users sees on the screen and uses at the keyboard. It includes menus, screen layouts, and use of function keys. It is this part of the software that makes each CD-ROM product unique. Vendors of online databases have designed the user interface on their CD-ROM products to look the same as the online interface, while often adding a second interface for novice users. Publishers such as Bowker, on the other hand, have taken the opportunity to develop a new and very user friendly interface.
>
> The search routines. These routines search the database indices for words or phrases requested by the user. The search routines translate the user request into commands that the retrieval engine uses to find and retrieve the data on disc.
>
> The editing routines. These allow for the editing of records and the creation of new records when the CD-ROM database is used for cataloguing or book ordering.
>
> The storage routines. These routines allow data to be copied to a floppy or hard disk or transferred to another computer system such as an in-house circulation system.

The print routines. For library systems, these would allow the printing of catalogue cards or labels.

The configuration routines. These routines allow the set-up of the CD-ROM system on the user's own computer, and also allow the customizing of certain functions, such as the entry of new data, or printing of a specific format of catalogue card.

Also required is the definition of unique systems requirements such as integration with online systems.

B. Choose the appropriate hardware system components

a) Select the computer and operating system environment. This involves decisions on the type and size of computer the system will run on. One option for NLC would to make the hardware compatible with other CD-ROM cataloguing systems in the field. A typical CD-ROM system includes:

- IBM PC or compatible with 512K memory
- RS-232 communications interface
- floppy or hard disk drive
- monitor
- CD-ROM drive and controller
- printer

b) Provide the required CD-ROM subsystem, i.e. software that allows the PC to address the data on the CD-ROM.

c) Determine packaging issues, e.g. how the applications software will be distributed (on floppy diskette or on the CD-ROM), how to package the CD-ROM disc, the original art work for the disc, etc.

2.2.2 Coordinate the disc production process

This step involves the pre-mastering and mastering of the CD-ROM. Most publishers today use a CD-ROM service bureau, but the process can be done in-house. The steps are as follows:

A. Produce tapes for input to the pre-mastering process.

This step is done by the publisher (in this case, NLC). It requires that the data is produced in a standard format, most likely CANMARC communications format, on 9 track tapes in ASCII format, although EBCDIC can be accepted and later converted to ASCII by the service bureau.

B. The CD-ROM vendor will perform the following steps:

a) index the data for use with the selected software.

b) prepare file directories and format the data for mastering. This involves taking the assembled database and mapping it physically onto magnetic tape in exactly the form it will reside on the finished disc.

c) schedule and coordinate disc mastering and replication. Disc mastering is done at several plants in the US and is coordinated by the CD-ROM service bureau.

d) screen disc replicas to assure quality and verify content.

2.2.3 Marketing and user support

A. Determine marketing and sales plan

a) Determine target market.

b) Set price.

c) Determine and implement marketing strategy.

B. Install and support user systems

a) Develop user manuals.

b) Determine the delivery system, i.e. who is responsible and how it will be done.

c) Test all hardware and software components to make sure they conform to the documentation.

d) Deliver the systems and support the installations.

e) Respond to service questions and provide maintenance as required.

There are several alternative approaches to the CD-ROM production process, offering a greater or lesser control over the process. Regardless of the alternatives, each of the above issues must be carefully thought through and planned.

2.3 THE MAJOR PLAYERS IN THE LIBRARY SERVICES CD-ROM MARKET

It has been estimated that about 50% of commercially available CD-ROM products are aimed at the library market. Certainly, the first commercially available CD-ROM product for any market was *BiblioFile*, which contains the full LC MARC database. While many of the CD-ROM products available today are aimed at the reference function in libraries, offering various indexes and reference texts, many others are aimed at the cataloguing or online catalogue functions. The major companies in this market are described below. They are divided into the traditional library suppliers, i.e. companies that offer various computer services to libraries and are now moving into CD-ROM products; and CD-ROM service bureaux, often called "ROM shops", which provide pre-mastering and related services for any application.

2.3.1 The traditional library suppliers

A. Library of Congress
Cataloging Distribution Service
Washington, DC 20541

The Cataloguing Distribution Service (CDS) of the Library of Congress released a Request for Proposal in March, 1986, and received bids from three companies. In the fall the contract was awarded to Online Computer Systems in Germantown, MD. Online produces the *Books in Print Plus* and *Ulrich's Plus* products for Bowker, and both have been well received by the user community. The LC RFP had originally asked companies to design a CD-ROM system for the Library of Congress, but all refused to do this as they had adequate proprietary systems in place.

The RFP had indicated that four CD-ROM products were to be produced:

a) The complete MARC service, with all formats, about 3 million records
b) Books All, about 2.5 million records
c) Name Authorities, almost 2 million records
d) Subject Authorities, almost 180,000 records

After a preliminary study by Online Computer Systems, a decision was made to start with the smallest database (subject authorities) first as it would fit on one disc and therefore the technical decisions were easier to make. It is estimated that name authorities will require 3 discs, while the complete service will require 7 or 8 discs, due to the extensive indexing required by LC. Books All will not be produced on disc as it is a subset of the complete service.

For each product, it is the intention of the CDS to produce a test disc for a 3 month test within the Library of Congress during which the update system will also be tested, then they will re-press the disc for the distribution service.

There was concern from the private sector regarding competition when the RFP was first released, but the first two products to be produced by LC contain data which are not available commercially. LC also feels that they are aiming at a different market than the commercial vendors, with their primary users their own overseas offices, followed by research libraries for which such features as the full ALA character set are important.

Initially, the software will allow the transport of records to another computer system, and the capability to print screen images. Editing of records and card creation software may be developed in the future.

While LC is using a service bureau approach to get started in this new technology, they are negotiating a new contract with Online Computer Systems to bring the production process in-house. Online Computer Systems will produce the first run for all products, then LC will run all updates on their CDS IBM mainframe through a software licensing arrangement.

LC intends to handle the disc distribution and customer support in-house. They realize this will require a different level of staff to those providing customer support at present.

A price has not yet been set for the subject authority disc.

B. **Online Computer Library Center (OCLC)**
6565 Frantz Road
Dublin, OH 43017-0702

OCLC is a nonprofit membership organization that provides its members with computer-based products, services, and systems designed especially for libraries. Over 7,000 libraries contribute to and/or use information in the OCLC online union catalogue of over 15 million unique bibliographic records and over 250 million location symbols. OCLC also provides local decentralized computer systems and stand-alone microcomputer-based systems for individual libraries.

OCLC has undertaken an extensive CD-ROM publishing program. Three services related to bibliographic and resource sharing functions are currently in development, while one service for reference use (described below) is currently available. OCLC'S cataloguing system is called the CAT CD450. This system is currently being field-tested and is projected for release early in 1988. With this system, OCLC plans to distribute subsets of the Online Union Catalog, with approximately 700,000 bibliographic records and their indexes on each disc. Based on an extensive study of record usage in the Online Union Catalogue, the following subsets are being considered for the initial distribution of the system:

a) records of books most frequently used with imprint dates of 1980 to the present, including both LC and non-LC records

b) most-used non-book records (all formats) plus book records with pre-1980 imprint dates

c) all LC Name and Subject Authority records

The number of discs per subset may vary. Also being considered are subsets for libraries needing special types of materials, such as law and medical libraries.

The system is designed to run on either one or four CD-ROM drives. If a library has more than one drive it is possible to have an authority file mounted at all times.

The CAT CD450 will allow libraries to search for records, edit them,,create new records, print catalogue cards and labels, and save records to a local file. The system will also provide an automatic log on to the OCLC Online Union Catalog to allow batch or dynamic searching for records that were not found on the compact disc and to allow downloading to the local save file for later editing.

No price has been set at this time for the CAT CD450, but OCLC is considering transaction-based pricing.

Two other products under development at OCLC include CD-Resource-sharing which will provide a union catalogue for groups of libraries and which will combine databases taken from various sources (not just OCLC records), and CD-OPAC which is under development for the local systems division of OCLC.

OCLC's current CD-ROM service is called the Search CD450 System. This is a reference system, providing local access to reference databases. The Search CD450

reference series will include bibliographic and citation databases obtained from a variety of sources. The series will be supplemented by specially created, subject-related subsets of the OCLC online Union Catalog. Each Search CD450 offering will use the same software, allowing patrons to access bibliographic information for many subject areas through one system.

The first Search CD450 to be released is the Search CD450 for Education. This package includes three databases on five separate compact discs. The full package sells for US$1199; this includes quarterly updates.

C. **Western Library Network (WLN)**
Washington State Library
Mail Stop AJ-11W
Olympia, WA 98504-0111

WLN is a nonprofit bibliographic utility serving about 350 online customers in the northwestern US including Alaska. WLN began in the mid 1970's as a mainframe-based library system for which the original software was written by Boeing Computer Services. In 1974 the State of Washington bought the software and established the Washington Library Network. In 1981, WLN sold a software licence to the National Library of Australia and there are now thirteen sites around the world with WLN software licences, including the British Library and the National Library of China.

WLN began development of their *LaserCat* product in 1985. Initially, it was seen as the solution to the problem of high telecommunication costs for their current and potential customers. WLN issued an RFP for consulting services which was won by Reference Technologies. RTI provided expertise on how to develop a CD-ROM product an provided the drivers for the Sony and Hitachi drives. WLN wrote their own software over the period of one year at an estimated cost of over $300,000. The resulting product is *LaserCat*, which is described in Part 1.

WLN will licence the *LaserCat* software for a one time fee of $100,000, and an annual maintenance fee of $20,000. The software is written in PL-1 for an IBM or compatible mainframe running the MVS/SP operating system.

D. **Utlas International Canada Ltd.**
80 Bloor Street West
Toronto, Ontario M5S 2V1

Utlas has been a supplier of automation services to the Canadian library community since 1973. While it grew out of a research and development project at the University of Toronto, it is now wholly owned by International Thomson Inc. Utlas services include CATSS and REFCATSS which provide a full cataloguing support system and interlibrary loan system on their central database of over 40 million records; the locally installed T/50 circulation control and online catalogue system; and the M/10 microcomputer-based online catalogue system for small libraries.

Utlas's CD-ROM product is the M/100 *DisCon* product, which offers over 6 million MARC records for retrospective conversion. It is designed to work with the main Utlas database, as *DisCon* allows the identification of a hit in the main database, but does not allow capture of the record locally. This product is leased for the

duration of the conversion project. It is described in more detail in Part 1 of this report.

Utlas also has a prototype online catalogue on CD-ROM, which will use their M-10 user interface software. This product was displayed at the recent ALA conference on WORM technology, although it will be offered on CD-ROM technology. The current product is designed as a read only catalogue, that is, no record editing or catalogue maintenance functions are available.

The Utlas M/100 *DisCon* product is pre-mastered at Reference Technology Inc. in Boulder, Colorado and mastered at a 3-M facility in the US

E. The Library Corporation
P.O. Box 40035
Washington, DC 20016

The Library Corporation was founded in 1974 and its main product was MARCFICHE, which contains Library of Congress MARC records on microfiche. *BiblioFile* is a private company owned by its founder, Brower Murphy.

In January 1985, The Library Corporation introduced the first commercial CD-ROM publication, the *BiblioFile* Catalog Production System. As mentioned earlier in this study, there are now over 900 *BiblioFile* installations in the US and 70 in Canada (NOTE: as of March 1988, these figures are approx. 1500 and 100, respectively). The Library Corporation did all of its own development for *BiblioFile* at a total cost of $250,000.

BiblioFile has continued its leadership in the field of CD-ROM publishing for libraries with the introduction of its Intelligent Catalog. This is an online catalogue which includes such features as a map of the library showing the location of a chosen book, and the Delmar Group's Fiction Advisor which prompts patrons for their reading interests in terms of a range of categories of popular literature and authors and then suggests works in the collection that would also be of interest.

The Intelligent Catalog allows catalogue updating with new records and indexes stored on a hard disk and incorporated with the CD-ROM search software so that any search includes both sets of records. The system also allows five display formats on the screen, including a card image and full MARC record formats as well as brief and full labelled formats.

F. General Research Corporation (GRC)
5383 Hollister Avenue
P.O. Box 6770
Santa Barbara, CA 93160-6770

General Research Corporation's business interests are primarily with the US Department of Defense but also includes interests in materials testing and occupational health as well as library data base management. GRC's revenues for 1986 were almost $62 million. It is owned by Flow General Inc., a technology based services and products company that operates internationally with revenues of $165 million in 1986.

GRC began to research and evaluate CD-ROM technology near the end of 1985 and in July of 1986 eight libraries received the first release of the *LaserQuest* workstation. As described earlier in this study, *LaserQuest* is a product designed for the cataloguing function, supplying a 5 million MARC record database on four main CD-ROM discs plus an update disc (updated monthly) supplied bimonthly. There are 40 *LaserQuest* installations in the US.

In the fall of 1986, GRC began development of its second commercial CD-ROM product, an online catalogue called *LaserGuide*. It was first demonstrated at ALA mid-winter in January 1987 and the first installations were scheduled for installation this fall. *LaserGuide* allows a patron to browse the library shelves by scanning in shelf list order and it also provides a floor plan of the library to indicate where selected books are located.

G. **Brodart Automation**
500 Arch Street
Williamsport, PA 17705

Brodart has been supplying books, supplies and furniture to libraries since 1939. The Automation Division was formed in 1975, and offers online cataloguing from a central database of 12 million records as well as automated catalogue products such as magnetic tapes, microfiche, cards and book catalogues.

Brodart Automation introduced *Le Pac*, the first online catalogue on CD-ROM in July, 1985. Libraries began using *Le Pac* in the spring of 1986, and they now have over 50 customers with over 400 workstations in the field. Several states are using *Le Pac* as a union catalogue, most notably Pennsylvania with the Access Pennsylvania project, Maine with MaineCat, and the state of Wisconsin. At present *Le Pac* functions solely as a read only public access catalogue, but the next release of the software will include a cataloguing module and an interlibrary loan module. *Le Pac* allows full authority control with a full reference structure in the catalogue.

Brodart provides a full CD-ROM service. They first create a database of customer records, perform authority control if desired, then pre-master the disc in-house. The database is updated from customer data as required.

H. **Library Systems & Services**
20251 Century Boulevard
Germantown, MD 20874

Library Systems & Services (LSSI), is a division of Gaylord, a library supply company. LSSI was founded in 1981 by a group of library professionals. The company offers a broad range of library automation support and other services to libraries, including facilities management, cataloguing, data conversion, generation of bibliographic products and consulting. The company is perhaps best known for its early MINIMARC product, and LASERFILE, the first laser- readable videodisc library product, with the LC MARC database on two twelve-inch videodiscs. LSSI has now developed a public access catalog on CD-ROM called Spectrum 200.

2.3.2 CD-ROM Service Bureaus

A. Reteaco Inc.
716 Gordon Baker Road
Toronto, Ontario M2H 3B4

Reteaco was established in April, 1984 and is currently one of two CD-ROM service bureaus in Canada. Reteaco has produced over 100 CD-ROM products for government departments and agencies, educational institutions, publishers and corporations in a range of industries. Applications have included operations and parts manuals, catalogues, telephone and business directories, dictionaries, newspapers, and magazines. Reteaco's one library application is the catalogue of the University of Guelph. They also produced test discs for both Micromedia and Info Globe, although both organizations have decided not to proceed with full production at this time. Info Globe felt that a user interface that was familiar to its online customers was an important feature.

Reteaco uses its own copyrighted search and retrieval software system called FindIt. At the present time, Reteaco offers a read only product, that is, it is not possible to edit records. However, Reteaco is willing to design this feature.

Reteaco provides full database preparation services including:

- user needs analysis
- project management
- database indexing
- screen/report format design
- search and retrieval software
- coordination of mastering and replication of CD-ROMs
- quality assurance

Reteaco offers joint-venture relationships whereby they offer product development and support services and take their fees (with the exception of direct expenses in the initial development) in the form of royalties rather than charging for the continued mastering and replication costs.

B. Online Computer Systems, Inc.
20251 Century Boulevard
Germantown, MD 20874

Online Computer Systems, a Reed Publishing Company, has been involved in library information systems development for over seven years. The company designs and implements optical- and videodisc-based systems, including such well known products as: *Books in Print Plus* and *Ulrich's Plus* for the R.R. Bowker Company; *PAIS* on CD-ROM for PAIS, Inc, of New York; *Verzeichnis Lieferbarer Bücher* (German Books in Print) for Buchhandler-Vereinigung GmbH of Frankfurt, Germany; *LASERFILE* and *Spectrum 200*, a public access catalogue on CD-ROM, for Library Systems and Services, a Gaylord Company.

Online Computer Systems also won the Library of Congress bid for CD-ROM products and has produced a prototype of the subject authority disc which is currently being test by LC. They will produce a second CD-ROM product for LC, containing the full MARC name authority file, later this year.

Online's CD-ROM software services and products are divided into six categories:

- Development tools
- Database building
- CD-ROM premastering
- CD-ROM drivers
- Retrieval engine
- Retrieval system

C. **Reference Technology Inc.**
5700 Flatiron Parkway
Boulder, CO 80301

Reference Technology, Inc. was established in 1982. Over its five-year history, the company has become a leader in laser optic information distribution systems. It emphasizes rapid, reliable data preparation and tailored applications services for conversion of information to CD-ROM. In addition to offering proprietary hardware and software products developed in-house, the company also supports hardware and software products available from vendors.

The company sells to information providers, government organizations and corporate clients who are either distributing information internally or selling it externally. RTI was the vendor used by the Western Library Network for consulting and pre-mastering services related to their *LaserCat* product, and it provides the pre-mastering services for the Utlas M/100 *DisCon* product.

D. **Megalith Technologies**
148 Colonnade Road, Unit 1B
Nepean, Ontario K2E 7R4

Megalith Technologies is a new Canadian firm offering CD-ROM production services. With a "teaming" arrangement with Reference Technologies, they can provide access to RTI expertise as well as their proprietary hardware and software. Megalith services include:

- Project management and consulting
- Selection of appropriate hardware, software and data service components
- Develop custom programming and user interfaces
- Convert data
- Premastering
- Coordination of mastering and replication process
- Providing customer support

2.3.3 Other organizations

Several other organizations have expressed an interest in the NLC project and have offered services related to marketing and support of and NLC product. These companies are Info Globe, Avec Technologies, which distributes several CD-ROM products, including *BiblioFile* in Canada, and CANEBSCO.

PART 3:
PRINCIPAL RELEVANT STANDARDS FOR CD-ROM

3.1 INTRODUCTION

The purpose of Part 3 of the feasibility study is to identify the CD-ROM standards and standards activities relevant to an NLC project. The objectives of Part 3 are:

a) Identify and briefly outline the content and status of the principal relevant existing and proposed standards. The most relevant standards are those which bear most directly on the development, implementation, marketing, and use of optical media systems in libraries. Potential problems relating to standards and compatibility will be identified.

The principal areas for standards are listed below. For some of these areas formal standards exist, for some formal standards are being finalized, some are *de facto* standards and some have no standards and none are likely to develop. The five areas are:

3.2 Physical standards for the CD-ROM disc.

3.3 Logical standards for the way the data is recorded on the disc.

3.4 Application standards for applications software such as index structures, user interfaces, etc.

3.5 Hardware standards for the hardware configuration needed to use a CD-ROM disc.

3.6 Publishing standards set by the Government of Canada.

Each of these areas is discussed below. Part 3 ends with a discussion of the activities and plans of other national agencies regarding optical media standards and the role that NLC should play in the development of standards.

3.2 PHYSICAL LEVEL STANDARD

The physical level standard for CD-ROM discs defines the physical characteristics of the disc (size, thickness, etc.), the way the data bits are physically stored on the disc, and the arrangement of error detection and correction codes, the number of bytes a sector contains, and so on. It was set by N.V. Philips, the Dutch electronics conglomerate, and the Japanese consumer electronics giant Sony. These two companies first developed a standard for CD-Audio discs, thereby allowing the enormous market for music on compact discs to develop rapidly. That standard is called "The Red Book".

Philips and Sony then followed up with a specification for CD-ROM based on the CD-Audio standard. This standard is known as "The Yellow Book" and it sets the physical parameters for a CD-ROM disc. CD-ROM is unique as an optical medium in having such a standard. No single format has been established for other optical media such as the videodisc and write-once disc. This single format is critical for a publishing medium, where the broad distribution of information requires compatibility between discs and multiple hardware systems. The Yellow Book covers such things as:

a) The size of the disc (diameter: 12 centimetres; thickness:1.2 millimetres; center hole: 15 millimetres)

b) Track layout: CD-ROM tracks arrange data in one continuous spiral, unlike magnetic discs, which are arranged in concentric circles. The spiral arrangement requires that the disc spin at a varying rate - faster when reading the centre of the disc and slower when reading the outer edge. This varying rate is referred to as a "constant linear velocity" or CLV and it allows the data to pass the reading head at a constant speed. This layout and variable speed means that more data can be stored on the disc, but the seek time is slower than for magnetic media.

c) Arrangement of the pits on the disc: Data is recorded on a CD-ROM surface in the form of pits (holes) and lands (flat surface). The laser reads the surface of the disc and when it detects a change from a pit to a land, or from a land to a pit, it records a "1". The run length between transitions is read as one or more "0's". Data is logically divided into sectors. The physical standard defines the layout of each sector as containing:

- synchronization data	12	bytes
- header data	4	bytes
- user data	2048	bytes
- error detection code	4	bytes
- unused space	8	bytes
- error correction data	276	bytes

d) Error correction: A stringent error correction method is much more important for CD-ROM than CD-Audio. To lose a few bits of data of music will likely not cause distortion in the sound, but a few bits of information is more critical. The error correction system for CD-ROM has been designed to compensate for errors arising from minute imperfections in materials or those arising in production, damage arising from scratches or fingerprints, dust and other particles on the disc surface.

3.3 LOGICAL LEVEL STANDARD

The physical level format described above defines the structure and content of sectors on the disc. The logical level format takes the organization of data on the disc one step further to define how those sectors are grouped into files and directories that are recognized by the operating systems of various computers.

When the CD-ROM industry began in 1985, each service bureau used their own logical format. This meant that each product was readable with a specific file management system, but not with any other file management system and that discs were not interchangeable between systems. In the fall of 1985, a group of interested companies active in the CD-ROM industry met at the High Sierra Casino in Lake Tahoe, Nevada to begin development of a logical format proposal for submission to official standards bodies. This group became known as the High Sierra Group. Their proposed standard became known as the High Sierra proposal.

The High Sierra proposal provided the basis of NISO document EE-1, "Volume and File Structure of Compact Read Only Optical Disks for Information Interchange". It was balloted by NISO in January and February of 1987 and the balloting was reviewed by the committee in April. It passed unanimously. However, the proposed international standard was simultaneously being prepared for balloting with ISO. During this process the U.S. cast a negative vote which was resolved in September. NISO is currently reviewing the ISO standard to document the differences and will re-ballot in the U.S. in January, 1988. The expected publication of American National Standard "Volume and File Structure of

CD-ROM for Information Interchange (Z39.60-198-)" will therefore be delayed until mid-1988. However, the standard is now well understood by all key players in the industry and is being implemented when it is felt to be advantageous.

3.3.1 Design Objectives

The primary purpose of the proposed standard was to allow applications to read data from a disc regardless of the operating system. The design objectives of the proposed standard included:

a) Develop a file format that compensates for the relatively slow seek time of the CD-ROM drives.

b) Maintain compatibility with Compact Disc Interactive (CD-I).

c) Provide for easy use with the most popular operating systems (MS-DOS, UNIX, VMS, and Apple DOS).

d) Optimize the design for read-only media.

3.3.2 Three levels of implementation

The High Sierra Proposal lists three levels of implementation for system developers so that not all systems have to support every feature within the proposed standard. Simpler systems can address only those levels appropriate to the application. The three levels are:

Level one - This is the lowest level and includes the minimum number of the High Sierra features. Most of the more sophisticated features (e.g. the handling of a multi-volume (multi-disc) sets) are not available in level one. However, any CD-ROM system that can read data in the High Sierra format can read a level one disc.

Level two - Provides some additional features, but includes many of the restrictions of level one. A level two system can read both level one and two discs, but not level three.

Level three - Represents the full implementation of the High Sierra standard. It requires an operating system that can handle features such as file extents, multi-volume sets, and interleaving. Level three systems can read discs developed to level one and two standards.

Many of the companies involved in the CD-ROM industry have announced that they will support the High Sierra standard, however, they clearly have the option to support it at different levels. At the present time, most operating systems are not designed to use all of the proposed features and few system manufacturers are likely to implement the entire Level 3 specification initially. The first version of the Microsoft MS-DOS Extensions, for example, is an early implementation that reads Level 1 formats, but not those of Levels 2 and 3. As the CD-ROM market grows, the standard will likely be implemented more fully.

For the CD-ROM consumer, adoption of the High Sierra standard will mean that discs can be purchased from a variety of sources and read on any CD-ROM drives, provided that the complete system (CD-ROM player, host computer, operating system, and retrieval software) and the discs themselves meet the minimum level of requirements in the standard.

3.4 FUTURE STANDARDS FOR DISCS

The logical level format deals with the identification and location of files and directories on a disc, but it does not deal with the recording of data within the files. Further work needs to be done on:

- Publisher identifier
- Data preparer identifier
- Application identifier
- Copyright file identifier
- Abstract file identifier
- Bibliographic file identifier

The NISO Board has agreed to a committee to consider these standards and the issue is currently being balloted with NISO members. It is expected that a committee will be established this Fall. Development of file content standards would take about one year. The ALA representative, Dan Iddings of RMG Consultants, is expected to chair the committee.

3.5 APPLICATIONS STANDARDS

The applications level of standards includes standards relating to index structures, the retrieval interface (search engine) and the user interface. At the present time, no standards exist for applications software and no proposals exist in the CD-ROM industry. The current feeling on the issue in the industry is that applications standards are not desirable at this time as they will inhibit innovation.

However, a proposal does exist within the national library community to standardize the user interface for national agency MARC distribution services on CD-ROM. There would be a significant advantage to libraries if these interfaces were standardized, as theoretically a library could interchange discs from each agency without having to boot new software or change to a different user interface. The International MARC Advisory Committee (IMAC) has established a CD-ROM Group to explore the possibility of a common software for CD-ROM products distributed by the national libraries. However, the obstacles to standardization appear to be formidable. One of the main problems is the variation in the MARC record format in each country and the problem of designing software that could accommodate all of the formats. Another problem is the fact that most national agencies are anxious to publish a product quickly and there is little will to wait for the development of a standard. The Library of Congress is already well advanced in its CD-ROM publishing program and is unlikely to change in favour of an international standard when it is developed.

The advantages and disadvantages of standardization for each software component both in general terms and for national library agencies are discussed below:

3.5.1 User Interface Standards

The user interface is the software that the user sees on the screen, and uses at the keyboard. The advantage of a user interface standard is that each product would have a common look and feel to it. While this would not be necessary or even desirable for all CD-ROM products, it would be desirable for the CD-ROM products which contain cataloguing information, and especially those products distributed by the national agencies. However, Library of Congress data is now distributed on optical media by seven

companies all of which have a different user interface, and the Library of Congress plans yet another product which will also be unique.

From the viewpoint of the CD-ROM industry in general, the disadvantage of having a standard user interface is that it would inhibit advances in the understanding of the man-machine interface. We still have much to learn about how people use computers to find information and a standard at this time would not be conducive to further development. The difference between the very "user friendly" user interfaces developed for CD-ROM products and the more difficult interfaces that were developed 15 to 20 years ago for online systems highlights this point. In addition, it is the differing user interfaces that give each product its unique character and market advantage. Books do not have a common user interface and this has been accepted as natural. Libraries have accepted the differences in the national bibliographies for Britain, the U. S. and Canada, all print tools used for an identical function.

For national agencies, there is the problem of choosing one vendor to provide the delivery system software for all participating countries, as well as the problem of accommodating multiple languages and national MARC formats.

3.5.2 Retrieval interface

The retrieval interface or search engine is the link between the database on the disc and the user interface software. It activates the search routines and retrieves the results. The advantage of standardizing the retrieval interface is that it would not be tied to any particular index structure or user interface.

The disadvantages are that getting agreement on standard command language would be difficult because of the vested interests in existing software.

3.5.3 Index structures

At the present time each CD-ROM service bureau has a different indexing approach. Standardizing the index structure would allow one type of retrieval program to access discs produced by multiple publishers, and publishers would have multiple sources for indexing. The disadvantage, of course, is that it would be difficult to agree on one set of indexes that meet the needs of all types of data. Also, standardization at this time would inhibit advancements in index structure design.

3.6 HARDWARE STANDARDS

When discussing CD-ROM standards, the most critical question is: "Can I buy one CD-ROM drive for my microcomputer and read any disc on it?" At the present time, the answer is no. CD-ROM drives do not interface to all microcomputers, and usually it is necessary to reboot and reconfigure the system each time a new disc is put into the drive. For some CD-ROM applications this is acceptable, for example, when a library has a stand-alone CD-ROM catalogue and the workstation is dedicated to that one function. However, for a cataloguing workstation where several sources of cataloguing may be required, each published on a separate disc or set of discs, interchangeability of discs is a major advantage. Fortunately, there are emerging standards which will allow full interchangeability of discs in the future.

The interchangeability of discs requires standardization of both the hardware and software as well as the format of the disc itself. There are six major components that contribute to a "standard" CD-ROM workstation:

- The microcomputer
- A CD-ROM drive which reads the data stored on the CD-ROM disc
- A hardware interface between the computer and the player
- Software to drive the CD-ROM player.
- Software to handle search and retrieval
- A CD-ROM disc in a format that can be read by the software

3.6.1 The microcomputer

Few CD-ROM software products run on anything but MS-DOS computers, despite the availability of hardware interfaces. All of the major drives work with IBM's, and all of the major databases come with MS-DOS-based search and retrieval software. This means that, in the short term at least, few database products will be developed for non-IBM compatible machines like the Macintosh, Amiga, or Atari. In the longer term this may change. However, at present, the IBM and IBM compatibles are a *de facto* standard machine for micro-based library applications and all CD-ROM products developed for the library market require an IBM or compatible.

3.6.2 The CD-ROM drive and interface

Two kinds of CD-ROM drives are available: those requiring a system specific interface and those using the Small Computer System Interface (SCSI - pronounced "scuzzy"). System-specific interfaces hook a particular drive to a particular computer. At present, the personal computers supported by system-specific interfaces are IBM PC's and compatibles, and the Apple IIe. The IIe interface can only be used with a 68000-based coprocessor.

The SCSI interface is a standard supported by many vendors in the personal computer market. SCSI has two advantages: you need only one interface card to hook up to peripherals from different manufacturers, and manufacturers don't have to produce different versions of their products for each type of computer. The disadvantage of the SCSI is that it doesn't perform optimally with any computer system because it is designed to be used with all of them.

The advent of SCSI drives means that many computers will be able to interface with CD-ROM drives. The question of compatibility, therefore, depends upon the software of the system.

3.6.3 Driver software

Driver software establishes communication between the computer and the CD-ROM drive. It informs the system where to go on the disc for information, such as header information. With the standardization of the logical format of files and directories on the disc (i.e. the High Sierra standard) it has been necessary to develop standard driver software to match the High Sierra discs. This standard driver software is being made available through what have come to be known as the "Microsoft extensions". These include a "patch" which enables a read/write operating system like DOS to work with a read-only storage peripheral, with files potentially over 500 megabytes in size. It also includes loadable device drivers for each of the different drives which allow the

computer to control each drive. Standardization of driver software will permit any CD-ROM workstation to recognize any High Sierra formatted CD-ROM disc.

3.7 PUBLISHING STANDARDS

An official at the Department of Supply and Services Publishing Centre reports that at the present time there are no Government of Canada standards for publishing machine-readable data. However, the Information Practices Group within Treasury Board is working on a policy dealing with the distribution of information on electronic media. Treasury Board is also exploring the publication of their Personal Information Index on CD-ROM and has been talking to the Publishing Centre regarding putting the Index of Federal Services and Programs on CD-ROM.

Two other federal ministries have published test CD-ROM discs - Statistics Canada, which does not publish through the Department of Supply and Services, and the Secretary of State Translation Bureau, which does. The Translation Bureau is testing a CD-ROM version of their Termium linguistic database. This disc carries on it the maple leaf identity with the name "Secretary of State/Secretariat d'Etat" and the date the disc was produced. The name of the database, "Termium, Linguistic database/Banque de linguistique" appears at the bottom of the disc. The left side of the disc carries the identity of the CD-ROM service bureau used (Reteaco) and the right carries the identity of the company that did the mastering.

Government of Canada publishing requirements are found in the *Treasury Board Canada Administrative Policy Manual*, Chapter 335. While the guidelines do not refer specifically to electronic media, the basic rules for external identification of the disc are evident from the Translation Bureau disc:

- The federal identity is provided by the maple leaf with two bars.
- The Department name is in English and French.
- The date of publication.
- The title of the database in English and French.

In addition, Chapter 335 states the requirements for the title page and copyright page of a book. These should be followed as appropriate for a copyright screen in the applications software.

A pilot project for a CD-ROM disc could be undertaken without the involvement of Supply and Services. However, if a decision is made to market and sell the CD-ROM, it must be approved by the Publications Decisions Committee of DSS.

3.8 KEY ORGANIZATIONS INVOLVED IN CD-ROM STANDARDS

There are many organizations involved in setting standards for CD-ROM systems. The key organizations include the High Sierra Ad Hoc CD-ROM Standards Committee, the Information Industry Association (IIA), the National Information Standards Organization (Z39) (NISO), an accredited organization for the American National Standards Institute, and the European Computer Manufacturers Association (ECMA) for Europe. The key players for the library community are the Library of Congress and the American Library Association. The role these organizations played in developing the American National Standard Z39.60-198- - " Volume and File Structure of Read Only Optical Discs for Information Interchange" is described below:

3.8.1 The High Sierra Ad Hoc CD-ROM Standards Committee

This informal working group takes its name from the place of its first meeting in the fall of 1985. The group felt strongly that the CD-ROM market should support numerous drives, computers and operating systems, and that a standard for the logical file format was essential. The formal standards process, however, normally takes from three to five years and that was too long to be without a standard. The group felt that a draft standard proposed by the key players in the industry could move through the standards process more quickly. The group includes the following CD-ROM vendors and manufacturers:

LaserData	Microware
Reference Technology, Inc	Microsoft
TMS, Inc.	Sony
Yelick, Inc.	VideoTools
3M	Activenture
Apple Computers	XEBEC Corporation
Digital Equipment Corporation	Hitachi America
Philips	

The standard is described above in Section 3.3, Logical Level Standard.

The group was ready to release their proposed standard on February of 1986, when Philips and Sony announced a new standard for inter-active compact discs, CD-I. This format would extend CD audio and CD-ROM to include various levels of audio, graphics, and digital data. The group delayed it proposal to incorporate the changes required to coordinate it with the graphics and sound capabilities of CD-I.

The group announced that its work was complete in June 1986 and formally presented its proposal to national and international standards organizations.

3.8.2 The Information Industry Association (IIA)

The Information Industry Association (IIA) has a Standards Committee, under which comes the CD-ROM Standards Subcommittee headed by Parke Lightbown of Utlas International U.S. Inc. This subcommittee includes many of the same companies involved in the High Sierra Group as well as database publishers like Dun & Bradstreet, Disclosure, Utlas, BRS, PsycInfo and other IIA member firms.

The aims of this group are:

- To serve as an open forum for the development of the functional requirements for the working standard, working with both the High Sierra Group on technical standards and the user interests as represented by the Library and Information Technology Association (LITA) of the American Library Association.
- To work for an early adoption of the resulting standard by the official standards organizations.
- To provide an educational service to IIA members on the technical issues involved in CD-ROM standardization and their business implications.

This group developed a list of functional requirements for the High Sierra Group which dealt with the desired results of CD-ROM as an information distribution medium rather

than technical requirements. They had three major concerns:

a) The interchangeability of CD-ROM discs and drives;

b) The optimized performance of CD-ROM discs and drives;

c) A freely available, minimal CD-ROM standard which allows for the widest possible variety of content types, presentation types, and software types.

The High Sierra Group's proposed standard generally satisfies the requirements of the committee. It now will focus its attention on other aspects of CD-ROM standardization and on questions regarding implementation.

3.8.3 National Information Standards Organization (Z39) (NISO)

NISO Z39 is a committee of the American National Standards Institute (ANSI) and concerns itself with standards for the library community. It formed a CD-ROM Standards Committee under the initiative of Parke Lightbown, an executive vice president of Utlas U.S. Inc. and chaired by Martin Hensel. In February, 1985, this committee was charged with the task of developing a draft ANSI Standard Compact Disk Data Format. The committee has representation from 3M, Mead Data Central, the Library of Congress, North American Philips, Digital Equipment Corp, Reference Technology Inc., American Psychological Association, OCLC, Newsbank, Disclosure, Wang Laboratories, Elsevier, and Information Handling Services.

3.9 ROLE OF OTHER NATIONAL AGENCIES AND NLC

3.9.1 Library of Congress

The Library of Congress participates on two ANSI standards bodies concerned with optical media. A staff member from the Automated Systems Office, Bill Nugent, participates on Committee X3.B11 which is concerned with digital optical data discs and is hardware-related. In this activity, the primary concern of LC is with the interchangeability of discs and with preservation. LC has a long history of preservation work with paper and are now doing the same with optical discs. They emphasize such issues as life testing and strong error correction techniques.

The Library of Congress is also a voting member of NISO Z39 and as such participates in reviewing and commenting on all issues that are under consideration by that committee.

3.9.2 National Library of Canada

NLC staff participate on the Canadian Advisory Committee to ISO TC46 - Information and Documentation, which deals with standards for libraries, archives, and publishers. This Advisory Committee reports to the Standards Council of Canada and provides the Canadian position on the relevant ISO standards through review and a formal balloting process. Canada has no formal relationship to NISO.

However, the next layer of standards for CD-ROM discs will deal with the structure and format of the files on a disc. For example, the MARC format is a possible format to record bibliographic file information. Because of the slowness in achieving international standards and the inter-relatedness of the U.S. and Canadian library markets, it is important that NLC watch the development of this next level of standards closely so that

Canadian needs are met. Of particular importance are the need to accommodate the CANMARC format and bilingual features. If these specifically Canadian needs are not accommodated, the needs of the francophone sector of the library market will not be met.

In order to monitor the development of this next level of CD-ROM standards closely, NLC should explore the possibility of observer status on NISO Z39 sub-committees to assure that Canadian requirements are accommodated.

PART 4:
PROJECT PHASES

The following outlines the phases required for a pilot project. Phases are structured to allow a "go/no go" decision point at the end of each phase.

Total project time is approximately 13 to 17 months from project initiation to a commitment to full production.

PHASE 1: PROJECT INITIATION AND DESIGN (3-4 MONTHS)

This phase will formalize the goals and objectives for the project, establish the project structure, hire a consultant and design the product, with the Request for Proposal as the end product. This phase ends with a decision to issue the RFP. Activities include:

1. Agreement to proceed.
2. Define the overall authority for the project. There should be one person who has ultimate authority for the project.
3. Appoint the project team. Ideally, this team should be kept small.
4. Clearly identify the goals, objectives, constraints, resources required, and projected schedule for the project.
5. Develop terms of reference and hire the consultant.
6. Design the product (define the primary market and needs, purpose, scope, data content, access points, updating requirements, user interface, editing, print routines, etc.).
7. Develop the Request for Proposal and the vendor list.

PHASE 2: VENDOR SELECTION (3-4 MONTHS)

During this phase, the RFP will be issued and a vendor selected. This phase ends with a recommendation regarding the successful vendor and a decision to contract with that vendor for the pilot disc production phase. Specific tasks include:

1. Issuance of the RFP
2. Evaluation of the vendor responses.
3. Recommendations.

PHASE 3: PILOT DISC PRODUCTION AND EVALUATION (5-6 MONTHS)

This phase requires completion of negotiations with the successful vendor, creation of the test disc and evaluation in the field. This phase ends with an evaluation report and a decision regarding full production. Specific tasks include:

- Negotiations with the chosen vendor.
- Further product design work with the vendor.
- Production of the data.
- Indexing, pre-mastering and mastering by the vendor.
- Receipt of pilot discs and access software.
- Development of documentation.
- Design and administration of the evaluation process including customer response, production staff response, and detailed product cost estimates.
- Delivery of access software and discs to test sites.
- Training for use of the CD-ROM system and for the evaluation.
- Preparation of the evaluation report.

PHASE 4: PREPARATION FOR FULL PRODUCTION (2-3 MONTHS)

This phase requires the set-up of a full production process as well as developing plans for marketing and customer support. It ends with production, marketing, and customer support plans in place and a decision to proceed to full production. Specific tasks include:

- Possible re-design of the product based on evaluation and possible re-tendering.
- Development of the production process and schedules.
- Development of marketing plans, including determining a price for the disc subscription.
- Assignment of responsibility for product distribution, customer training and support.

PHASE 5: FULL PRODUCTION

With this phase, the CD-ROM disc becomes an integral part of library services.

TOTAL PROJECT ELAPSED TIME: 13 TO 17 MONTHS